

Serial No. 10/539,751

Docket No. HI-0190

Amdt. dated April 21, 2009

Reply to Office Action of January 22, 2009

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A dual journaling storing method for storing data in a storage medium, characterized in that data are stored from start and end locations of the storage medium toward a central location, wherein ~~when two types of the data central location is~~ variably formed based on at least one of a respective amount of data to be whose kind and characteristics are different are stored or a size of a respective in the storage space in which ~~medium, the two types of data is to be~~ are separately stored as a front journaling and a rear journaling, respectively, wherein when a head of the front journaling and a head of the rear journaling meet each other at a first location, a central location is set at the first location and the head of the front journaling is returned to the start location and the head of the rear journaling is returned to the end location, wherein the central location moves toward the other party's journaling if the head of the front journaling or the head of the rear journaling arrives again at the central location and the other head is not located at the central location, and wherein the head is indicative of a location for storing data.

2. (Canceled).

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3. (Currently Amended) The dual journaling storing method according to claim-2 1, wherein when the front journaling and the rear journaling meet each other at the central location, data is again stored from the start location and the end location, respectively.

4-5. (Canceled).

6. (Currently Amended) A method for storing data in a storage medium, comprising:
dividing the data into a first data and a second data; and
storing one of the first data and the second data from a start location of the storage medium, and storing the other from an end location of the storage medium toward the start location, wherein ~~in the case that~~ when a head of the first data and a head of the second data are stored and meet each other at a first location, a central location is set at the first location, ~~storing corresponding and the first and the second data again are stored~~ from the start location and the end location, respectively, and wherein the central location is variably formed based on at least one of a respective amount of data to be stored or a size of a respective storage space in which the data is to be stored.

7. (Canceled).

8. (Currently Amended) The method according to claim 6, further comprising:

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~~when wherein the central location is formed for a moves toward the other party's data if a head of the first data or a head of the second data arrives again at time and then formed for a subsequent time, moving the central location in a progressing direction of data arriving first and the other head is not located at the central location, and wherein the head is indicative of a location for storing data.~~

9. (Currently Amended) A flash memory device, comprising:
- a processor that generates a read/write command for reading/writing data from/to a specific address;
 - a flash memory that provides a data storage space; and
 - a memory controller that controls the data to be stored in the flash memory from start and end locations of the data storage space toward a central location, wherein ~~when the data whose characteristics are different are stored in the flash memory, the data are separately stored as a front journaling and a rear journaling, wherein when a head of the front journaling and a head of the rear journaling meet each other at a first location, a central location is variably formed based on at least one of a respective amount of the data to be stored or a size of a respective storage space in which the data is to be stored set at the first location and the head of the front journaling is returned to the start location and the head of the rear journaling is returned to the end location, wherein the central location moves towards the other party's journaling if the head of the front journaling or the head of the rear journaling arrives again at~~

the central location and the other head is not located at the central location, and wherein the head is indicative of a location for storing data.

10. (Currently Amended) A multiple-partitioned flash memory device, comprising:
 - a memory;
 - a plurality of partitions provided by a multiple partition of the memory, in which data being stored are independently read, written, or erased;
 - a charge pump that provides a plurality of voltage levels necessary to read, write, and erase the data;
 - a plurality of first sense amplifiers configured for a read operation, the read operation being simultaneously executable for the respective partitions; and
 - a plurality of second sense amplifiers including at least one sense amplifier configured for erase and write operations, the erase and write operations being simultaneously executable for the respective partitions, wherein the data are stored in the respective partitions from start and end locations of storage spaces of the respective partitions toward respective central locations, wherein the central locations are variably formed based on at least one of a respective amount of the data to be stored or a size of a respective storage space in which the data is to be stored in the respective partitions, wherein when data whose characteristics are different are stored in each partition of the memory, the data are separately stored as a front journaling and a rear journaling, wherein when a head of the front journaling and a head of the

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rear journaling meet each other at a first location, a central location is set at the first location and the head of the front journaling is returned to the start location and the head of the rear journaling is returned to the end location, wherein the central location moves toward the other party's journaling if the head of the front journaling or the head of the rear journaling arrives again at the central location and the other head is not located at the central location, and wherein the head is indicative of a location for storing data.

11. (Canceled).

12. (Currently Amended) The multiple-partitioned flash memory device according to claim ~~14~~ 10, wherein in a case that the front journaling and the rear journaling meet each other at the central location, the data is again stored from the start location.

13. (Canceled).

14. (Original) The multiple-partitioned flash memory device according to claim 10, wherein the data being stored in the respective partitions are divided into a meta data and a file data, the file data being stored from the start locations of the respective partitions, the meta data being stored from the end locations of the respective partitions toward the start locations.

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15-19. (Canceled).

20. (Currently Amended) A dual journaling storing method for storing data in a memory sectioned into multiple partitions, data being independently read, written, or erased according to the respective partitions, characterized in that the data is stored from start and end locations of storage spaces of the respective partitions toward a central location, wherein ~~the central location is variably formed based on at least one of a respective amount of a garbage collection is performed at the data to be stored or a size of a respective storage~~ front journaling and the rear journaling independently when a free space in which the data is to be stored in the respective partitions is insufficient.

21. (Currently Amended) The dual journaling storing method according to claim 20, wherein in a case that data having different characteristics is stored in ~~a storage medium~~ the memory, the data are separately stored as a front journaling and a rear journaling.

22. (Previously Presented) The dual journaling storing method according to claim 21, wherein in a case that the front journaling and the rear journaling meet each other at the central location, the data is again stored from the start location and the end location, respectively.

23. (Currently Amended) The dual journaling storing method according to claim 21,

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wherein ~~in a case that~~ when a head of the front journaling and a head of the rear journaling meet each other at a first location, to form the a central location for a first time and then the central location is formed for a second time or more set at the first location and the head of the front journaling is returned to the start location and the head of the rear journaling is returned to the end location, wherein the central location moves toward the other party's journaling ~~when if~~ the head of the front journaling or the head of the rear journaling arrives again at the central location and the other head is not located at the central location, and wherein the head is indicative of a location for storing data.

24. (Original) The dual journaling storing method according to claim 21, wherein the data being stored in the respective partitions are divided into a meta data and a file data, the file data being stored from the start locations of the respective partitions, the meta data being stored from the end locations of the respective partitions toward the start locations.

25. (Currently Amended) A dual journaling storing method for storing data in a memory sectioned into multiple partitions in a case that the data are inserted into the respective partitions of a flash memory, wherein the data are independently read, written, or erased according to the respective partitions, the dual journaling storing method comprising:

when the insertion of the data into the respective partitions is requested, a storage medium performing a garbage collection if a storage space is insufficient, thereby moving the

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data and carrying out an erase operation; and

checking whether there is a sufficient space in the storage medium after the data storage is completed, thereby securing a storage space for a next inserted data, wherein when the erase operation is carried out, the free storage space is secured and a valid data of the data moves to a head location of the respective partitions, wherein when data whose characteristics are different are stored in each partition of the memory, the data are separately stored as a front journaling and a rear journaling, wherein when a head of the front journaling and a head of the rear journaling meet each other at a first location, a central location is set at the first location and the head of the front journaling is returned to the start location and the head of the rear journaling is returned to the end location, wherein the central location moves toward the other party's journaling if the head of the front journaling or the head of the rear journaling arrives again at the central location and the other head is not located at the central location, and wherein the head is indicative of a location for storing data.

26. (Canceled).

27. (Previously Presented) The method according to claim 8, wherein a number of erasures of the storage medium is reduced by said moving the central location for each subsequent time.

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28. (Previously Presented) The method according to claim 6, wherein the first data is meta data and the second data is file data.

29. (Canceled).

30. (Currently Amended) The method according to claim 25, wherein when the erase operation is carried out, the free storage space is secured and a tail corresponding to an end location of at least one of a front journaling data or a rear journaling data of the respective partitions moves to a central location of the storage space of the storage medium, wherein the tail is indicative of a location for starting to erase data.

31. (Previously Presented) The method according to claim 25, wherein when the erase operation is carried out, the free storage space is secured and a valid data of the data moves to a head location of at least one of a front journaling data or a rear journaling data of the respective partitions.

32. (Previously Presented) The method according to claim 31, wherein the central location is variably formed based on at least one of a respective amount of data to be stored or a size of a respective storage space in which the data is to be stored from the start and end locations of the storage medium.

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33. (New) The dual journaling storing method according to claim 1, wherein a garbage collection is performed at the front journaling and the rear journaling independently.

34. (New) The dual journaling storing method according to claim 33, wherein the garbage collection is performed when a free space is insufficient.

35. (New) The flash memory device according to claim 9, wherein a garbage collection is performed at the front journaling and the rear journaling independently.

36. (New) The flash memory device method according to claim 35, wherein the garbage collection is performed when a free space is insufficient.